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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/057,359   | 10/23/2001  | William P. Delaney   | 01-021              | 2012             |
| 24319  | 7590        | 09/12/2005           | EXAMINER            |                  |
| LSI LOGIC CORPORATION<br>1621 BARBER LANE<br>MS: D-106<br>MILPITAS, CA 95035 |             |                      | TRAN, DENISE        |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 2189                |                  |

DATE MAILED: 09/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

**Application No.**

10/057,359

**Applicant(s)**

DELANEY, WILLIAM P.

**Examiner**

Denise Tran

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 13-20, 33 and 34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 21-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. The applicant's amendment filed 6/2/05 has been considered. Applicant's election without traverse of group I, claims 1-12 and 21-32 during the telephone conversation with Peter Scott (Reg. No. 33,279) on 2/28/05
2. Claims 13-20 and 33-34 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected non-elected invention, there being no allowable generic or linking claim. Election was made **without** traverse during the telephone conversation with Peter Scott (Reg. No. 33,279) on 2/28/05.
3. Claims 1-12 and 21-32 are presented for examination.
4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 8-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Yanai et al., U.S. Patent No. 5,742,792. The rejections are maintained.

As per claim 1, Yanai teaches the use of a mirrored storage volume system, capable of incoherency correction, comprising

a primary storage controller capable of managing data, wherein the primary storage controller is capable of cyclic redundancy checking stored data (e.g. figure 1, element 16 and col. 40, lines 17-31);

a primary storage volume suitable for storing data, wherein the primary storage volume is linked to the primary controller (e.g. figure 1, element 20);

a secondary storage controller capable of accepting transferred data from the primary storage controller, wherein the secondary controller is capable of cyclic redundancy checking stored data (e.g. figure 1, element 44 and col. 40, lines 17-31);

a secondary storage volume linked to the secondary storage controller wherein the secondary storage volume is capable of storing data mirroring the primary storage volume (e.g. figure 1, element 48 and col. 2, lines 29-38); and

a communication channel linking the primary controller to the secondary controller wherein the communication channel is suitable for communicating data transfers (e.g. figure 1, element 40).

As per claim 8, Yanai teaches the use of the primary storage controller is capable of directing the primary storage volume to read and write data (e.g. col. 3, lines 50-52).

As per claim 9, Yanai teaches the use of the second storage volume is geographically remote from the primary storage volume (e.g. col. 2, lines 29-38).

As per claims 10-12, Yanai teaches the use of a volatile memory linked to the primary storage controller, wherein the volatile memory is suitable for maintaining a coarse grain bit map which maintains the bit map if the communication channel is interrupted and contains data representing changes to the primary storage volume (e.g. col. 29, lines 35-55 and col. 36, lines 10-25).

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai et al., U.S. Patent No. 5,742,792. in view of Bauer et al., U.S. Patent No. 5,870,759, hereinafter Bauer. The rejections are maintained.

As per claims 2-5, Yanai does not specifically show the use of either the primary storage controller or the secondary storage controller initiating the CRC check of their own storage after an interruption in the communication channel and comparing the CRC scans from each volume and requesting non-matching data blocks. Bauer shows the use of either the primary storage controller or the secondary storage controller initiating the CRC (i.e., checksum) check of their own storage after an interruption in the communication channel and comparing the CRC (i.e., checksum) scans from each volume (e.g. abstract and figures 5-6) and requesting non-matching data blocks (e.g.

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figures 5-6). It would have been obvious to one of ordinary skill in the art to combine Bauer with Yanai because it would provide for proper data consistency.

8. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai et al., U.S. Patent No. 5,742,792. in view of "Official Notice". The rejections are maintained.

As per claims 6 and 7, Yanai does not specifically show the use of CFC scans at a set time period or the scan being low priority. "Official Notice" is taken that both the concept and advantages of providing for CFC scans at a set time period or the scan being low priority is well known and expected in the art. It would have been obvious to one of ordinary skill in the art to include CFC scans at a set time period or the scan being low priority to Yanai because it would provide for continuous data consistency and prevent the interruption of higher priority tasks, such as performing the mirroring itself.

9. Claims 21 and 28-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai et al., U.S. Patent No. 5,742,792. in view of Howard et al., U.S. Patent No. 6,629,198, hereinafter Howard. The rejections are maintained.

As per claim 21, Yanai teaches the use of a mirrored storage volume system, capable of incoherency correction, comprising

a primary storage controller capable of managing data, wherein the primary storage controller is capable of cyclic redundancy checking stored data (e.g. figure 1, element 16 and col. 40, lines 17-31);

a primary storage volume suitable for storing data, wherein the primary storage volume is linked to the primary controller (e.g. figure 1, element 20);

a secondary storage controller capable of accepting transferred data from the primary storage controller, wherein the secondary controller is capable of cyclic redundancy checking stored data (e.g. figure 1, element 44 and col. 40, lines 17-31);

a secondary storage volume linked to the secondary storage controller wherein the secondary storage volume is capable of storing data mirroring the primary storage volume (e.g. figure 1, element 48 and col. 2, lines 29-38); and

a communication channel linking the primary controller to the secondary controller wherein the communication channel is suitable for communicating data transfers (e.g. figure 1, element 40).

Yanai does not specifically show the use of the controllers performing at least one of a MD-5 and a SHA-1 scan. Howard shows the use of performing at least one of a MD-5 and a SHA-1 scan (e.g., col. 3, lines 47-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Howard with Yanai because it would provide for a more robust hashing function, as taught by Howard.

As per claim 28, Yanai teaches the use of the primary storage controller is capable of directing the primary storage volume to read and write data (e.g. col. 3, lines 50-52).

As per claim 29, Yanai teaches the use of the second storage volume is geographically remote from the primary storage volume (e.g. col. 2, lines 29-38).

As per claims 30-32, Yanai teaches the use of a volatile memory linked to the primary storage controller, wherein the volatile memory is suitable for maintaining a coarse grain bit map which maintains the bit map if the communication channel is interrupted and contains data representing changes to the primary storage volume (e.g. col. 29, lines 35-55 and col. 36, lines 10-25).

10. Claims 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai et al., U.S. Patent No. 5,742,792, in view of Howard et al., U.S. Patent No. 6,629,198, hereinafter Howard and in further view of Bauer et al., U.S. Patent No. 5,870,759, hereinafter Bauer. The rejections are maintained.

As per claims 22-25, Yanai does not specifically show the use of either the primary storage controller or the secondary storage controller initiating the correction check of their own storage after an interruption in the communication channel and comparing the correction scans from each volume and requesting non-matching data blocks. Bauer shows the use of either the primary storage controller or the secondary storage controller initiating the correction (i.e., checksum) check of their own storage after an interruption in the communication channel and comparing the correction (i.e., checksum) scans from each volume (e.g. abstract and figures 5-6) and requesting non-matching data blocks (e.g. figures 5-6). It would have been obvious to one of ordinary



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skill in the art to combine Bauer with Yanai because it would provide for proper data consistency.

11. Claims 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai et al., U.S. Patent No. 5,742,792. in view of Howard et al., U.S. Patent No. 6,629,198, hereinafter Howard and in further view of "Official Notice". The rejections are maintained.

As per claims 26 and 27, Yanai does not specifically show the use of scans at a set time period or the scan being low priority. "Official Notice" is taken that both the concept and advantages of providing for scans at a set time period or the scan being low priority is well known and expected in the art. It would have been obvious to one of ordinary skill in the art to include scans at a set time period or the scan being low priority to Yanai because it would provide for continuous data consistency and prevent the interruption of higher priority tasks, such as performing the mirroring itself.

12. Applicant's arguments filed 6/2/05 have been fully considered but they are not persuasive.

13. In the remarks, the applicant argued that "Yani" did not disclose CRC checking data stored on a primary storage volume as recited in claim 1.

In response to applicant's argument that Yanai reference fails to show certain features of applicant's invention, it is noted that the features upon which applicant relies

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(i.e., checking data stored on a primary storage volume) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In this case, Yanai teaches what in claim 1 is "cyclic redundancy checking stored data," such as (col. 40, lines 17-31). According to fig. 1, el.16; col. 40, lines 17-31 also, col. 38, lines 6-15 and col. 37, line 40 and et seq., disclosed a system including a storage controller capable of CRC on data where data has been stored before transmitting. As such, Yanai disclosed each and every limitation and anticipated the claimed invention.

14. In the remarks, the applicant argued that "Yani" fails to teach maintaining a coarse grain bitmap as recited in the claims; Also in the reference all data is stored rather than storing a coarse grain bitmap as recited in the claims.

The examiner disagreed with the applicant's argument because as cited in the last office action, Yanai col. 36, lines 10-25 teaches the use of maintaining bitmap where the bitmap contains data presenting changes to the primary storage volume. Also, Yanai, col. 35, lines 15-60, teaches maintaining a coarse grain bitmap or storing a coarse grain bitmap as recited in the claims.

15. In the remarks, the applicant argued that "Yani"/Bauer failed to disclose a system in which the primary storage controller initiates a CRC of the primary storage volume upon reestablish of communication.

The examiner disagreed with the applicant's argument because Yanai/Bauer discloses a system in which the primary storage controller initiates a CRC of the primary storage volume upon reestablish of communication. For example, Bauer, fig. 5-6., el. 105, 140, abstract; el. 140 and col. 9, lines 40-42 teaches the use of either the primary storage controller or the secondary storage controller initiating the CRC (i.e., checksum) check of their own storage upon reestablishment after an interruption in the communication channel.

16. In the remarks, the applicant argued that Bauer fails to teach a system in which the primary controller is capable of comparing the results of a CRC on the primary storage volume with a CRC scan conducted on the secondary storage volume because Bauer a system in which all data must be communicated to the client in order to detect modification before the modification are propagated to the server.

The examiner disagreed with the applicant's argument because the combination of Yanai and Bauer teaches all the claim limitation as discussed in the rejections above. For example, Bauer, fig. 5-6., el. 140, abstract; el. 140 and col. 10, lines 30-35; col. 12, lines 38-55 teaches the use of either the primary storage controller or the secondary storage controller comparing the CRC (i.e., checksum) scans from each volume (e.g. abstract and figures 5-6). Therefore, the cited references teach all the claim limitations.

17. In the remarks the applicant argued that the combination of "Yani"/Howard would suggest the utilization of a write-ahead hash log for use in communication rather than the present invention.

The examiner disagreed with the applicant's argument because the combination of Yanai/Howard would suggest a system performing of at least one of a MD-5 and SHA-1 as claimed. In particular, Yanai does not specifically show the use of the controllers performing at least one of a MD-5 and a SHA-1 scan. Howard shows the use of performing at least one of a MD-5 and a SHA-1 scan (e.g., col. 3, lines 47-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Howard with Yanai because it would provide for a more robust hashing function, as taught by Howard, col. 3, lines 55-63.

18. In the remarks, the applicant's argued that the Howard reference, while mention in the introductory paragraph is not cited in the text of the rejection, thus it is believed that the pending rejection is based solely on the Yanai/Bauer combination.

The examiner disagreed with the applicant's argument because according to the applicant's amendment filed 6/2/05, page 6, lines 4-5, the applicant believed that the rejection of claims 22-25 is based on "Yanai in view of Howard, further in view of Bauer. The rejection is..." not solely on the Yanai/Bauer combination. In addition, it is noted that claims 22-25 including all the limitations of claim 21; therefore, the rejection of claims 22-25 also including rejection claim 21. While Howard was mentioned in the text

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of claim 21 which is part of the text of claims 22-25, thus it is believed that the rejection based on the Yanai, Howard, and Bauer combination.

19. Applicant has failed to seasonably challenge the examiner's Official Notices in the previous office action, those limitations are now considered as prior art. MPEP 2144.03.

20. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise Tran whose telephone number is (571) 272-4189. The examiner can normally be reached on Monday, Thursday, and Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on (571) 272-4182. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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